Claim Rejections - 35 USC § 103

The Examiner States:

Claims 1-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Moreno (EP-0 839 891) in view of George A. Olah, Hydrocarbon Chemistry (pages 35-36).

The Moreno reference discloses a process for producing a non-toxic aromatic oil having less than one mutogenicity index. See page 7, lines 35-40. Moreno discloses the use of an extract from a feed plant and a distillate. See page 4, lines 31-32 and page 21, line 28. The Moreno reference discloses a process whereby the extract is selected from the group consisting of different cuts of extracts of a lube plant. See page 21, line 28. The Moreno reference discloses a process whereby the distillate is selected from the group consisting of different cuts of distillate of a vacuum distillation unit. See page 4, line 29.

The Moreno reference does not disclose a process whereby the extract from a lube plant and a distillate are pre-blended in a feed tank. The reference does not disclose hydrotreating the pre-blend feed. The reference does not disclose mixing a suitable grade, calculated amount of an extract stream to a distillate stream of desired properties; a process wherein the proportion of said extract component to said distillate in said pre-blend is in the range of 1-99%; or a process wherein the proportion of the extract component in the pre-blend is in the range of 1-50%. The reference does not disclose a process wherein the hydrogenation of the feed uses an appropriate hydrotreating catalyst selected from the group consisting of Nickel-Molybdenum and Nickel-Cobalt.

The Olah reference discloses hydrotreating of oil and discloses the use of Nickel-Molybdenum and Nickel-Cobalt as hydrotreating catalysts. See pages 35-36.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby the extract from a lube plant and a distillate are pre-blended in a feed tank because distillate is used to make and is a component of extract flow obtained in the manufacture of lubricant base oils. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a process whereby a suitable grade, calculated amount of an extract stream is mixed to a distillate stream of desired properties; a process wherein the proportion of said extract *component* to said distillate in said pre-blend is in the range of 1-99%; or a process wherein the proportion of the extract component in the pre-blend is in the range of 1-50% because since both the distillate and the extract are necessary for making non-carcinogenic aromatic

oil it would be proper to combine them in any ratio effective for producing such oil. It would have been obvious to one having ordinary skill in the art at the time the invention was made to hydrotreat the pre-blend feed because hydrotreating can be used in processing feeds with high aromatic content. See Olah pages 35-36. It would have been obvious to one having ordinary skill in the art at the time the invention was make to utilize Nickel-Molybdenum and Nickel-Cobalt as hydrotreating catalysts because these are commonly used as hydrotreating catalysts. See Olah, pages 35-36.

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moreno (EP-O 839 891) in view of George A. Olah, Hydrocarbon Chemistry (pages 35-36) as applied to claim above, and further in view of Cash (USPN 6,224,747).

The Cash reference discloses hydrotreating conditions in the range of about 482 F-932 F and pressure in the range of 500 psi to 3,500 psi. See Column 7, lines 50-55.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize these conditions because these are standard hydrotreating conditions and hydrotreating is a necessary part of the process of producing non-carcinogenic, high aromatic oil.

The rejection of Claims 1-7 is, respectfully, traversed.

The rejection is based on the Moreno patent [EP-0 839 891] for non-toxic oils by blending vacuum distillate with extract in view of George A. Olah, Hydrocarbon Chemistry (pages 35-36).

The Moreno patent describes the process of taking an extract mix (which includes solvent) and processing it to make a low PCA aromatic oil by counter-current extraction. Moreno's claim utilizes extract mix and not extracts. Embedded in this claim is the addition of a second high flash point hydrocarbon stream to improve the yield. Including an additional hydrocarbon stream to Applicants' invention, would result in a significantly different yield. Applicants' invention has no waste stream (extract of extract) and generates an environmentally friendly hydrotreated product. The Examiner's view of combining the two cited references is not obvious to persons versed in the art. This is true because blending an extract mix with a hydrocarbon stream followed by a hydrotreating process lead to catalyst poisoning. This is a well-known catalyst deactivation problem in the petroleum refining industry and is very serious both economically and for safety reasons.

Several such deactivation can be found in the literature, e.g., [**Ref.1.** Thakur, D. S., Thomas, M. G. Appl. Catal. 1985, 15, 197-225. **Ref. 2.** Bartholomew, C. H., Butt, J. B., Eds. Catalyst Deactivation 1991; Studies in Surface Science and Catalysis 68; Elsevier: Amsterdam, 1991. **Ref. 3.** Delmon, B., Froment, C. F., Eds. Catalyst Deactivation 1994; Studies in Surface Science and Catalysis 88; Elsevier: Amsterdam, 1994. **Ref. 4.** Bartholomew, C. H. In Catalytic Hydroprocessing of Petroleum and Distillates; Oballa, M. C., Shih, S. S., Eds.: Marcel Dekker: New York, 1994; pp 1-31. **Ref. 5.** Absi-Halabi, M., Beshara, J., Qabazard, H., Stanislaus, A., Eds.; Catalysts in Petroleum Refining and Petrochemical Industries 1995; Studies in Surface Science and Catalysis 100; Elsevier: Amsterdam, 1996. **Ref. 6.** Delmon, B., Froment, C. F., Eds. Catalyst Deactivation 1987; Studies in Surface Science and Catalysis 34; Elsevier: Amsterdam, 1987, pp 39-58 and 81-104.].

Thus, preblending an extract (without any solvents) with a distillate and hydrotreating is not practiced, to Applicants' knowledge, and is potentially very difficult to do, except by using the specific technologies in Applicants' invention, to obtain the product that is detailed in this invention. It is unique in this invention that Applicants show one can very selectively remove Sulfur and remove higher aromatic rings, while keeping the same aromatic level to that of a feed stream or a slight improvement in aromatics which leads to higher solvency power. Table 1 clearly establishes this fact.

The Olah reference and Cash reference establish that hydrotreating is a well known and well practiced art for reducing aromatics via saturation of aromatic rings. This hydrotreating process to remove polycyclic aromatic rings reduces total aromatics significantly.

The uniqueness of Applicants invention stems from the fact that Applicants are using a distillate stream blended with extract and hydrotreating to get to a unique product. The product aromaticity is reflected by pentachlorophenol solubility, but maintains non-carcinogenic characteristics as indicated by the Modified Ames Test.

The uniqueness also comes from the fact that prior art does not claim to make an unlabeled oil economically from the use of hydrotreating alone. The reasoning is that prior art has not applied hydrotreating to a one-stage process to produce a clean oil. Moreno does not apply hydrotreating nor is there in the literature a case for economic production via hydrotreating alone. The uniqueness is that by blending a

distillate, which will be lower in PCA, but high in aromatics, Applicants are able to make a clean oil in a single step. That is the difference.

The claims have been rewritten as noted above, now obviating the Examiner's rejections.

Applicants respectfully request reconsideration of claim 12, the sole remaining claim now pending in the application and submit that, in view of the rewritten claims and arguments presented herein, the Examiner's rejection of the claims under 35 U.S.C. § 102, 103 and 112 have been overcome. The Examiner is respectfully requested to withdraw the rejections. It is submitted that the claims, as now presented, are proper for allowance, which allowance is respectfully requested.

It is believed that no additional fees are due at this time. If this is in error, the Commissioner is hereby authorized to charge any such fee to Deposit Account No. 19-1800.

If the Examiner feels that a telephone conversation would assist in bringing this case to a conclusion, he is requested to contact the undersigned at 713-782-3620.

Respectfully submitted,

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